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ORIGINAL ARTICLE

EARLY PREDICTORS OF PREGNANCY INDUCED HYPERTENSION

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ABSTRACT: OBJECTIVES: To evaluate role of early pregnancy BMI and diastolic BP as predictors of gestational hypertension and preeclampsia and to estimate early pregnancy serum uric acid levels and correlate it with gestational hypertension and pre eclampsia. **METHOD:** 100 pregnant women with singleton gestation in first trimester of pregnancy(8 – 12 weeks) coming for their first antenatal check-up in the antenatal clinic of Mahatma Gandhi Medical college and Hospital, Sitapura Jaipur were included in the study and their body mass index, diastolic pressure and serum uric acid were recorded. **RESULT:** Out of the 100 pregnant women studied, 8 developed pre eclampsia in later half of pregnancy. There was a significant correlation of high BMI (>23 kg/m2) in early pregnancy with later development of PIH (p = 0.000).Similarly women with elevated serum uric acid levels (>5mg/dl) in the first trimester were also more likely to develop PIH (p =0.010) while the relationship of higher diastolic BP (>80mmHg) in early pregnancy to later development of PIH was found to be not statistically significant (p =0.117). **CONCLUSION:** There is a need for high quality, large scale multi-center trials which enroll patients with different risks of developing the syndrome and throughout multi-ethnical background, in order to assess the predictive value of different markers and finally propose the best marker combination for a routine use in clinical settings.

INTRODUCTION: Hypertensive disorders of pregnancy comprise of a spectrum of diseases that include pre-existing hypertension, gestational hypertension, pre eclampsia, eclampsia and HELLP syndrome. They are one of the most important health problems and contribute greatly to maternal and perinatal morbidity and mortality globally particularly in developing countries. The prevalence as well as the impact of these disorders is more severe in developing countries as reflected by higher number of maternal deaths and complications related with eclampsia. These discrepancies are because of poor patient education, limited access to prenatal care, inappropriate diagnosis and management of the patients.

Despite the fact that little is known about the pathogenesis of pre eclampsia, one of the recognized hypotheses is that it develops as a result of immune maladaptation between mother and fetus resulting in alteration of placental formation with decrease in utero placental blood flow leading to IUGR. In the second trimester clinical manifestation which is hypertension and proteinuria may eventually lead to angiospasm and eclampsia[1].

Although the pathogenesis is complex, evidence shows that early diagnosis and treatment can minimize maternal and perinatal morbidity and could prevent maternal and perinatal mortality[2]. Therefore the need for predictors of hypertensive disorder are particularly greatest in our country. These predictors should be reliable and suitable for implementation in low and middle income groups.

The ideal predictors are those

- which have high sensitivity and specificity

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- which appear before clinical manifestations and can modify care to prevent complications and death
- which should be affordable and easy to perform

AIMS AND OBJECTIVES:

- to evaluate role of early pregnancy BMI and diastolic BP as predictors of gestational hypertension and preeclampsia
- to estimate early pregnancy serum uric acid levels and correlate it with gestational hypertension and pre eclampsia

MATERIAL AND METHODS: 100 pregnant women with singleton gestation, with no obstetrical or medical problems, non smoker, in first trimester of pregnancy(8 – 12 weeks) coming for their first antenatal check-up in the antenatal clinic of Mahatma Gandhi Medical college and Hospital, Sitapura Jaipur were included in the study. Following parameters were recorded

- Body mass index
- Diastolic BP
- Serum uric acid

OBSERVATIONS AND RESULTS:

Sl. NO.	BMI (Kg/m)	NO. OF PATIENTS	PATIENTS DEVELOPING PIH IN THIRD TRIMESTER	PERCENTAGE
1.	<19	15	NIL	0
2.	19 - 23	72	3	4.16
3.	>23	13	5	38.46
TOTAL		100	8	8

ANOVA P value 0.000

Sl. NO.	DIASTOLIC BLOOD PRESSURE (mm Hg)	NO. OF PATIENTS	PATIENTS DEVELOPING PIH IN THIRD TRIMESTER	PERCENTAGE
1.	<70	12	NIL	0
2.	70 - 80	63	2	3.17
3.	80- 90	25	6	24
TOTAL		100	8	8

ANOVA P value 0.117

Sl. NO.	SERUM URIC ACID(mg/dl)	NO. OF PATIENTS	PATIENTS DEVELOPING PIH IN THIRD TRIMESTER	PERCENTAGE
1.	<5	79	2	2.53
2.	>5	21	6	28.57
TOTAL		100	8	8

ANOVA P value 0.010

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Sl. NO.	PARAMETER	NO. OF PATIENTS	PATIENTS DEVELOPING PIH IN THIRD TRIMESTER	PERCENTAGE
1.	BMI RAISED diastolic BP AND S.URIC ACID NORMAL	0	0	0
2.	BMI AND diastolic BP RAISED S.URIC ACID NORMAL	0	0	0
3.	BMI AND S.URIC ACID RAISED diastolic BP NORMAL	0	0	0
4.	BMI diastolic BP AND S.URIC ACID RAISED	13	5	38.46
5.	diastolic BP RAISED BMI AND S.URIC ACID NORMAL	4	0	0
6.	diastolic BP AND S.URIC ACID RAISED BMI NORMAL	8	1	12.5
7.	S.URIC ACID RAISED BMI AND diastolic BP NORMAL	0	0	0
8.	BMI diastolic BP AND S.URIC ACID NORMAL	75	2	2.6

DISCUSSION AND RESULTS: PIH refers to onset of hypertension with or without proteinuria and /or end organ dysfunction after 20 weeks of gestation in previously normotensive women. The clinical onset can occur anytime from second trimester to first week postpartum but the initial pathological changes and biochemical abnormalities begin early in first trimester [3, 4].

The objective of our study was to ascertain whether serum uric acid, BMI and diastolic BP or their combination predicts development of PIH in women without any medical disorders (diabetes, hypertension, renal or hepatic disease).

Our study included 100 women in their first trimester (8 – 12 weeks) attending antenatal clinic of Mahatma Gandhi Medical College and Hospital, Sitapura, Jaipur. At the initial presentation we recorded diastolic BP, BMI and measured serum uric acid levels besides routine investigations and followed these women till term.

After analyzing our results we observed that hyperuricemia (serum uric acid > 5mg / dl) is highly significant in predicting the development of PIH ($p = 0.010$). Lancet et al had also concluded that mean serum uric acid values (5.5mg/dl) were significantly higher in women with PIH compared to controls [5]. High BMI (>23 kg/m2) was found to be highly significant ($p = 0.000$) predictor of PIH in our study. O Brian et al had also concluded that maternal obesity is an important risk factor for development of PIH [6]. They determined strong association between pre pregnant high body mass and risk of preeclampsia. Ability of diastolic BP measurement in early pregnancy to predict pre eclampsia is limited. Raised diastolic pressure (80 – 90 mm Hg) was statistically not significant ($p = 0.117$) predictor of PIH. Colin et al found that mean arterial pressure measurement was not significant predictor of pre eclampsia [7].

Categorizing women by risk of PIH and providing tailored ante natal care will minimize complications of PIH.

SUMMARY AND CONCLUSION: Regardless of the lack of existing prophylactic and therapeutic means against preeclampsia, the search for non-invasive, blood-borne or urinary biomarkers that could predict the development or assist in the detection of this life-threatening pregnancy disorder is still of utmost importance. The availability of such markers could have decisive impact on the medical management of pregnant women and their child (e.g. refer to a tertiary centre) but also on the health costs associated with this poor medical condition [8, 9, 10].

Despite there exist many different potential markers for preeclampsia, the reliability of these markers in predicting preeclampsia has been inconsistent between different studies. Furthermore, preeclampsia is a multifaceted disorder, certain say it is not one but several diseases. Therefore, there is a need for high quality, large scale multi-center trials which enroll patients with different risks of developing the syndrome and throughout multi-ethnical background, in order to assess the predictive value of different markers and finally propose the best marker combination for a routine use in clinical settings.

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